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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/084,043

02/27/2002

Joseph A. Kwak

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8075

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7590

05/10/2006

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EXAMINER

TSEGAYE, SABA

ART UNIT

PAPER NUMBER

2616

DATE MAILED: 05/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/084,043

Applicant(s)

KWAK, JOSEPH A.

Examiner

Saba Tsegaye

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/16/06 & 4/18/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed 02/17/06. Claims 1-6 and 10 are pending. Currently no claims are in condition for allowance.

Claim Rejections - 35 USC § 103

2. Claims 1, 2, 5, 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schramm et al. (US 6,208,663) in view of Malkamaki et al. (US 6,735,180), Fong et al. (US 6,760,860) and Yonge III et al. (US 6,522,650).

Regarding claims 1 and 10, Schramm discloses, in Figs. 3 and 5, a method for adjusting data modulation at base station comprising:

receiving data at a transmitter for transmission (a radio base stations 22);

formatting the received data into packets for transmission to the receiver, each packet having a particular encoding/data modulation (a radio base stations 22; column 5, lines 46-58);

transmitting the packets (column 5, lines 25-45);

monitoring a return channel for receipt of acknowledgment for reach packet that the packet has been received (column 7, lines 39-53; column 8, lines 37-42);

retransmitting that received packet at the transmitter, if an acknowledgment for that packet is not received (column 7, lines 39-53).

Further, Schramm discloses that the ARQ protocol is the RLC layer. An LLC frame to be transmitted by RBS is segmented into RLC blocks then transmitting the blocks to the mobile station through the physical layer (**data is received from a higher layer ARQ mechanism**).

Schramm does not disclose that data is formatted by a physical layer transmitter and generating an acknowledgment at the physical layer and physical layer ARQ mechanism operates transparently with respect to the higher layer ARQ mechanism.

However, higher layer ARQ mechanism is well known in the art.

Malkamaki teaches a fast feedback scheme for a fast physical layer hybrid ARQ for data transmitted in the downlink direction. Further, Malkamaki teaches that one way to speed up the whole process is to generate the feedback data in **physical layer** of the receiver. Similarly of the transmissions should be generated at the **physical layer** of the transmitter. Alternatively, the feedback and the retransmission can also be generated in a layer, which is co-located with the physical layer (column 1, lines 54-60).

Fong teaches a dual ARQ type arrangement (see Fig. 2 and abstract), which is layer 1 and layer 2 both support ARQ operation (column 2, lines 45-53 (as in claim 1)).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Schramm's ARQ method to incorporate the teachings from Malkamaki of a physical layer ARQ mechanism and a dual type arrangement from Fong, the motivation being that the ARQ system will be more reliable by eliminating any long delay between the higher layer and the physical layer.

Schramm, further, teaches that a copy of the FEC coded blocks is stored by the transmitting entity prior to modulation. If retransmission is requested for a particular block, that block can be retrieved from storage and fed into a different modulator (column 6, lines 4-11). Malkamaki, also, teaches that the sender must store any packet for possible retransmission *until such time that* the sender receives acknowledgement from the receiver that the packet has been

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received properly (column 3, line 63-column 4, line 7). However, Schramm in view of Malkamaki, and Fong does not expressly disclose limiting the number of retransmissions to an operator-defined integer value, and clearing the buffer memory after the integer value is reached.

Yonge illustrates, in Figs. 23 and 24, flow diagrams of a response resolve process performed by the frame transmit process of TX handler. Further, Yonge teaches that process 444 determines if the NACK-count is greater than the NACK-count threshold (in this example, a threshold of 4). If the NACK-count is determined to be greater than the threshold of 4, then the frame is discarded (column 26, line 60-column 27, line 41, esp. column 27, lines 13-22).

It would have been obvious to one ordinary skill in the art at the time of the invention was made to add a retransmission counter that limits the number of retransmissions to an operator defined integer value and clears the buffer memory after the integer value is reached, such as that suggested by Yonge, in the retransmission system of Schramm in view of Malkamaki, and Fong in order to reduce implementation complexity and to reduce the number of retransmission times thereby the transmission quality in real-time transmission is improved.

Regarding claim 2, Schramm discloses the method wherein the particular encoding/data modulation is forward error correction FEC encoding /data modulation (column 7, line 54-column 8, line 11).

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Regarding claim 5, Schramm discloses the method wherein the acknowledgments are transmitted on the fast feedback channel using a CDMA air interface (column 4, lines 49-56).

Regarding claim 6, Schramm discloses the method further comprising transmitting a negative acknowledgment, if that packet has an unacceptable error rate (column 7, lines 39-45).

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schramm in view of Malkamaki, Fong and Yong as applied to claim 1 above, and further in view of Agee (US 6,128,276).

Schramm in view of Malkamaki, Fong and Yong discloses all the claim limitations as stated above except for: the packets are transmitted using an OFDMA air interface in which frequency sub channels in an OFDMA set may be selectively nulled.

Agee teaches a radio communication method that is compatible with discrete multiple tone and orthogonal frequency-division multiplex-like frequency channelization techniques (column 4, line 19-column 5, line 40).

It would have been obvious to one ordinary skill in the art at the time of the invention was made to add a method that transmit packets using an OFDMA air interface, such as that suggested by Agee, in the method of Schramm in view of Malkamaki, Fong and Yonge in order to allow stationary and linear channel distortion to be modeled as an exactly multiplicative effect on the transmit spreading code.

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4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schramm in view of Malkamaki, Fong and Yonge as applied to claim 1 above, and further in view of Birru (US 2002/0037058).

Schramm in view of Malkamaki, Fong and Yonge discloses all the claim limitations as stated above. Further, Schramm discloses that the invention is applied to all types of access methodologies including FDMA, TDMA, CDMA and hybrids thereof. However, Schramm in view of Malkamaki, Fong and Yonge does not expressly disclose wherein the packet are transmitted using a single carrier having a frequency domain equalization (SC-FDE) air interface.

Birru teaches that a multi-standard demodulator, which includes COFDM, a frequency domain equalizer for single carrier results in a cost-effective solution compared to a time domain equalizer.

It would have been obvious to one ordinary skill in the art at the time of the invention was made to use SC-FDE, such as that suggested by Birru, in the multi-access methodologies of Schramm in view of Malkamaki, Fong and Yonge in order to provide cost effectiveness and multi-path performance (0059).

Response to Arguments

5. Applicant's arguments with respect to claims 1-6 and 10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saba Tsegaye whose telephone number is (571) 272-3091. The examiner can normally be reached on Monday-Friday (7:30-5:00), First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on (571) 272-7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ST

May 2, 2006

A handwritten signature in black ink, appearing to read 'Doris H. To', with a stylized flourish at the end.

DORIS H. TO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600